

What is claimed is:

1. A mobile device communications system which has a plurality of service providing servers, and
5 is used for communications by a mobile terminal, comprising:

a first network unit which is connected to the mobile terminal and has a plurality of input/output points to and from the service providing servers;

10 a plurality of first communications distribution units respectively connected to the plurality of input/output points;

a second network unit connected to said first communications distribution unit;

15 a third network unit connected to the plurality of service providing servers; and

a plurality of second communications distribution units which are connected between said second network unit and said third network unit, for
20 distributing a series of communications between the mobile terminal and the service providing server to any of the plurality of service providing server, characterized in that

25 said first communications distribution unit distributes a series of communications between said

mobile terminal and service providing servers to any of said plurality of second communications distribution units through said second network unit.

5 2. The system according to claim 1, characterized in that

each of said plurality of first communications distribution units comprises a same storage contents of distribution destination storage unit
10 storing any of said plurality of second communications distribution units to which a series of communications are to be distributed corresponding to an identifier of a session as the series of communications between the mobile
15 terminal and the service providing servers.

3. The system according to claim 1, characterized in that:

the plurality of service providing servers form a plurality of groups each being configured by servers providing same services;

the mobile terminal specifies a representative address for each of the plurality of groups to communicate with service providing servers; and

25 said second communications distribution unit

distributes the series of communications to any of the service providing servers in a group specified by the representative address.

5 4. The system according to claim 3, characterized in that

when the mobile terminal changes the representative address for a change of a service to be obtained in the series of communications by the
10 mobile terminal, said second communications distribution unit distributes subsequent communications in the series of communications to any of the service providing servers in the group specified by the representative address after the
15 change to continue the series of communications.

5. The system according to claim 1, further comprising

a service authentication unit checking whether
20 or not a user of the mobile terminal has a right to receive a service provided by the service providing servers when said second communications distribution unit distributes the series of communications to any of the plurality of service
25 providing servers.

6. The system according to claim 1, characterized in that:

5 said second communications distribution unit can distribute the series of communications not only to the plurality of service providing servers, but also to a server external to said mobile device communications system; and

10 said system further comprises an accounting information generation unit generating accounting information about a service received by the mobile terminal from the service providing servers or a server external to said mobile device communications system.

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7. The system according to claim 1, further comprising

20 a session management device assigning an identifier to a session as a series of communications between the mobile terminal and the service providing servers to manage the identifier.

8. The system according to claim 7, characterized in that

25 said second communications distribution unit

assigns an identifier to a user session as a series
of communications in a layer higher than a layer
corresponding to a session managed by said session
management device in a hierarchical structure of
5 communications, and distributes communications in
the user session between the mobile terminal and
the service providing servers to any of the
plurality of service providing servers.

10 9. The system according to claim 8, characterized
in that

15 there are a plurality of types as types of the
user session, and said second communications
distribution unit distributes communications in the
user session corresponding to the type of the user
session.

20 10. A mobile device communications method for use
with a plurality of service providing servers for
communications by a mobile terminal, comprising the
steps of:

25 the mobile terminal transmitting a packet in a
series of communications by specifying any of the
plurality of service providing servers;

 a load balancer, which received the packet,

distributing the packet to any of the plurality of packet gateway devices corresponding to an identifier for the series of communications; and

5 said packet gateway device which was assigned the packet distributing the packet to any of the plurality of service providing servers for performing the same services as the service providing server specified by the mobile terminal.

10 11. The method according to claim 10, characterized in that:

the series of communications are a session managed by a session management device; and

15 said packet gateway device distributes a packet corresponding to a user session as a series of communications in a layer higher than a layer corresponding to the session in a hierarchical structure of communications.

20 12. A computer-readable portable storage medium which is used by a computer configuring a packet gateway device for distributing communications to a service providing server between a plurality of load balancers and service providing servers
25 connected to a network to which a mobile terminal

is connected in a mobile device communications system having the plurality of service providing servers for establishment of communications performed by the mobile terminal, and stores a 5 program used to direct the computer to perform the steps of:

storing a destination address and a source address of a packet received from the load balancer using a unique source port number as a key;

10 setting the unique source port number as a source port number of a packet header;

selecting any of a plurality of service providing servers capable of providing a service requested by the mobile terminal from among the 15 plurality of service providing servers such that the loads of the service providing servers can be balanced; and

transmitting a packet to the service providing server with an address of the selected service providing server set as a destination address, and 20 an address of the device set as a source address.

13. The storage medium according to claim 12, characterized in that

25 an identifier for a user session as a series

of communications in a layer higher than a layer corresponding to a session as a series of communications between the mobile terminal and the service providing server in a hierarchical structure of communications is used as the unique source port number.

14. A program used by a computer configuring a packet gateway device for distributing communications to a service providing server between a plurality of load balancers and service providing servers connected to a network to which a mobile terminal is connected in a mobile device communications system having the plurality of service providing servers for establishment of communications performed by the mobile terminal, and is used to direct the computer to perform the procedures of:

20 storing a destination address and a source address of a packet received from the load balancer using a unique source port number as a key;

setting the unique source port number as a source port number of a packet header;

25 selecting any of a plurality of service providing servers capable of providing a service

requested by the mobile terminal from among the plurality of service providing servers such that the loads of the service providing servers can be balanced; and

5 transmitting a packet to the service providing server with an address of the selected service providing server set as a destination address, and an address of the device set as a source address.

10 15. The program according to claim 13, characterized in that

an identifier for a user session as a series of communications in a layer higher than a layer corresponding to a session as a series of 15 communications between the mobile terminal and the service providing server in a hierarchical structure of communications is used as the unique source port number.

20 16. A computer-readable portable storage medium which is used by a computer configuring a packet gateway device for distributing communications to a service providing server between a plurality of load balancers and service providing servers 25 connected to a network to which a mobile terminal

is connected in a mobile device communications system having the plurality of service providing servers for establishment of communications performed by the mobile terminal, and stores a 5 program used to direct the computer to perform the steps of:

retrieving mobile device identification information about a mobile terminal as a source of a packet received from the load balancer;

10 retrieving a destination address of the received packet;

determining whether or not a service provided by the service providing server of the destination address can be provided for a user of the mobile 15 terminal.

17. A computer-readable portable storage medium which is used by a computer configuring a packet gateway device for distributing communications to a 20 service providing server between a plurality of load balancers and service providing servers connected to a network to which a mobile terminal is connected in a mobile device communications system having the plurality of service providing 25 servers for establishment of communications

performed by the mobile terminal, and stores a program used to direct the computer to perform the steps of:

5 retrieving from a packet received from the load balancer a destination address and a source address of the packet when a series of communications between the mobile terminal and the service providing server start, and setting the addresses in an accounting record;

10 incrementing a number of packets of an accounting record each time a packet is received from the load balancer until the series of communications terminate, retrieving a packet length from the received packet, and adding the 15 packet length to the packet length of the accounting record; and

20 setting again the source address of the accounting record into identification information about a user of the mobile terminal, and the destination address into information about the service providing server.

18. A program used by a computer configuring a packet gateway device for distributing 25 communications to a service providing server

between a plurality of load balancers and service providing servers connected to a network to which a mobile terminal is connected in a mobile device communications system having the plurality of 5 service providing servers for establishment of communications performed by the mobile terminal, and is used to direct the computer to perform the procedures of:

retrieving mobile device identification 10 information about a mobile terminal as a source of a packet received from the load balancer;

retrieving a destination address of the received packet;

determining whether or not a service provided 15 by the service providing server of the destination address can be provided for a user of the mobile terminal.

19. A program used by a computer configuring a 20 packet gateway device for distributing communications to a service providing server between a plurality of load balancers and service providing servers connected to a network to which a mobile terminal is connected in a mobile device 25 communications system having the plurality of

service providing servers for establishment of communications performed by the mobile terminal, and is used to direct the computer to perform the procedures of:

5 retrieving from a packet received from the load balancer a destination address and a source address of the packet when a series of communications between the mobile terminal and the service providing server start, and setting the
10 addresses in an accounting record;

incrementing a number of packets of an accounting record each time a packet is received from the load balancer until the series of communications terminate, retrieving a packet length from the received packet, and adding the packet length to the packet length of the
15 accounting record; and

setting again the source address of the accounting record into identification information about a user of the mobile terminal, and the destination address into information about the service providing server.

20. A mobile device communications system which
25 has a plurality of service providing servers, and

is used for communications by a mobile terminal, comprising:

5 a network unit which is connected to the mobile terminal and has a plurality of input/output points to and from the service providing servers;

a plurality of first communications distribution units respectively connected to the plurality of input/output points; and

10 a plurality of second communications distribution units, connected between said plurality of first communications distribution units and the plurality of service providing servers, for distributing a series of communications between the mobile terminal and the 15 service providing server to any of the plurality of service providing servers, characterized in that

20 although the communications between the mobile terminal and the service providing server are performed through any of the plurality of input/output points of the network unit from start to termination of the series of communications, any of said plurality of first communications distribution units distributes the series of communications to a same second communications distribution unit from among said plurality of 25

second communications distribution units.